Missouri Department of Natural Resources
Water Protection Program
Financial Assistance Center

Facility Plan/Environmental Information Document Guidance for Clean Water State Revolving Fund (SRF) Funded Projects

Engineering Reports or Facility Plans are required for State Revolving Fund (SRF) Projects. The following guidance has been prepared for engineering consultants to provide a comprehensive list of the department's recommendations and requirements for state and federally funded projects. The following should be considered as suggested guidance, except where reference has been made to the regulations, which may include **10 CSR 20-4, 6, 7 and 8**.

This document addresses the planning, engineering and environmental aspects of a project. While the rules for SRF address separately the requirements for a facility plan and environmental impact document, most applicants incorporate both of these documents into a single Facility Plan and Environmental Information Document.

The Engineering Report or Facility Plan identifies and evaluates wastewater related problems; assembles basic information; presents criteria and assumptions; examines alternate projects, with preliminary layouts and cost estimates; describes financing methods, sets forth anticipated charges for users; reviews organizational and staffing requirements; offers a conclusion with a proposed project for client consideration; and outlines official actions and procedures to implement the project. The planning document must include sufficient detail to demonstrate that the proposed project meets all applicable criteria.

The concept (including process description and sizing), factual data and controlling assumptions and considerations for the functional planning of wastewater facilities are presented for each process unit and for the whole system. This data forms the continuing technical basis for the detailed design and preparation of construction plans and specifications.

Drawings identifying the site of the project and anticipated location and alignment of proposed facilities are required. Architectural, structural, mechanical and electrical designs are usually excluded. Sketches may be desirable to aid in presentation of a project. Outline specifications of process units, special equipment, etc., are occasionally included.

The level of effort required to prepare Facility Plans and the depth of analysis within should be proportional to the size and complexity of the proposed project. It is anticipated that projects involving minor collection system, pump station, and interceptor work will not be as detailed as projects involving new, expanded or rehabilitated wastewater treatment facilities or major sewer projects. A professional engineer registered in Missouri must sign and seal all Engineering Reports or Facility Plans.

1. Title Page

Name of Project
Owner of System
Preparer Name, Address, Phone Number, Fax Number, Seal and Signature
Date of Submittal

2. Table of Contents

3. Introduction

The introduction should state the purpose for the project and should include an evaluation of the conditions and problems needing correction. It should also include any schedules contained in enforcement related administrative orders or agreements.

The recommended project may be presented in the introduction or at the end of the engineering report, whichever is desired by the writer.

4. Existing Conditions and Projections

Sketches should indicate the planning area and existing and potential future service areas.

Present and predicted population shall be based on a 20 year planning period. Phased construction of wastewater facilities should be considered in rapid growth areas. Sewers and other facilities with a design life in excess of 20 years should be designed for the extended period.

Please note that master facility plans can be approved for multiple phases of construction and loans; however, as per 10 CSR 20-4.050, the Finding of No Significant Environmental Impact (FNSI) is only effective for a period of five years. Projects based upon a master facility plan approved more than five years ago will have to obtain new Environmental Clearances and conduct public participation. Master facility plans older than five years should also be updated for current opinion of costs.

5. Existing Facilities Evaluation

Existing Collection System: The Existing Facilities Evaluation should include a brief inventory of the collection system, including approximate miles of gravity sewers and forcemains, number of pump stations and related pump station capacity. An analysis of the existing collection system is not required if the project is for a wastewater treatment facility only. Cities that have large collection systems need only to report on the collection system in the drainage basin in which the project being studied is located.

If an infiltration/inflow (I/I) analysis has been conducted, the facility plan should present the findings of the study along with the recommendations for the most cost-effective solution to the excessive I/I.

Existing Wastewater Treatment Facility: Please provide a detailed description of the existing treatment facility along with an estimate of the capacities of each process unit and the capacity of the facility as a whole. Please include a sketch or drawing that shows the layout of the treatment facility. The age and condition of each process unit should be evaluated and presented. A copy of the current National Pollutant Discharge Elimination System (NPDES) permit should also be included. Problems with the current treatment facility should be identified and recommendation made for correction.

6. Existing Hydraulic Load

Projections shall be made from actual flow data to the extent possible. **See 10 CSR 20-8.140(5)(C)1.B.** for detailed requirements**.** The probable degree of accuracy of data and projections shall be evaluated. This reliability estimation should include an evaluation of the accuracy of existing data, as well as an evaluation of the reliability of estimates of flow reduction anticipated due to infiltration/inflow reduction or flow increases due to elimination of sewer bypasses and backups.

Please include critical data and the methodology used. The department recommends that graphical displays of critical peak wet weather flow data be included for a sustained wet weather flow period of significance to the project.

For consistency, the department suggests that the following flow definitions be used as a basis for design of sewers, lift stations, wastewater treatment plants and treatment units.

A. Design Average Flow – The design average flow is the average of the daily volumes to be received for a continuous 12-month period expressed as a volume per unit time. However, the design average flow for facilities having critical seasonal high hydraulic loading periods (e.g., recreational areas, campuses, industrial facilities) shall be based on the daily average flow during the seasonal period.

B. Design Maximum Day Flow – The design maximum day flow is the largest volume of flow to be received during a continuous 24-hour period expressed as a volume per unit time.

C. Design Peak Hourly Flow – The design peak hourly flow is the largest volume of flow to be received during a one hour period expressed as a volume per unit time.

D. Maximum Month Flow – The maximum flow to be received in a continuous 30-day period expressed as a volume per unit time.

7. Existing BOD and TSS Loading

Sufficient composite samples of the influent wastewater should be taken to characterize the organic strength. The average organic load must be determined and it is recommended that peak month and peak day loading rates also be determined. Existing data should be evaluated for reliability and accuracy. **See 10 CSR 20-8.(5)(C)2.**

For consistency, the department suggests that the following definitions be used for design of wastewater treatment facilities.

A. The five-day Biochemical Oxygen Demand (BOD) is defined as the amount of oxygen required to stabilize biodegradable organic matter under aerobic conditions within a five-day period in accordance with **Standard Methods for the Examination of Water and Wastewater.** The carbonaceous five-day Biochemical Oxygen Demand (CBOD) is defined as BOD less the nitrogenous oxygen demand of wastewater.

B. Design Average BOD – generally the average of the organic load received for a continuous 12-month period for the design year expressed as weight per day. However, the design average BOD for facilities having critical seasonal high loading periods (e.g., recreational areas, campuses, industrial facilities) shall be based on the daily average BOD during the seasonal period.

C. Design Maximum Day BOD – is the largest amount of organic load to be received during a continuous 24-hour period expressed as weight per day.

8. Flow and Organic Strength for New Systems

New sewer systems shall be designed on the basis of an average daily per capita flow of sewage of not less than 100 gallons per day. **See 10 CSR 20-8.120(5)(A).** In the absence of flow measurement data, peak flows for the design of sewers shall be based on the equation found at **10 CSR 20-8.120(5)(B).**

The design for sewage treatment plants to serve new sewerage systems being built in currently undeveloped areas shall be based on an average daily flow of 100 gallons per capita, unless water use data or other justification upon which to better estimate flow is provided. **See 10 CSR 20-8.140(5)C)1.A.(I).**

For design of new wastewater treatment facilities in currently unsewered areas, the design organic strength must be in accordance with **10 CSR 20-8.140(5)C)2.A.**

9. Project Development

The determination of probable effluent limits received from the department in the form of a water quality review sheet must be included. Also include any special water quality studies completed by or on behalf of the applicant.

The project shall be consistent with the approved elements of any applicable water quality management plan under Section 208b of the Federal Clean Water Act. **See 10 CSR 20-6.010(9)(F)**

Consideration should be given to transport of wastewater to a regional wastewater treatment facility, when feasible. **See 10 CSR 20-6.010(3)(C)**

Whenever a project proposes a new discharge, consideration should be given to the feasibility of constructing a no-discharge. **See 10 CSR 20-6.010(4)(D)1.** When feasible, is the department recommends that unsewered communities consider centralized management of onsite sewage systems.

The facility plan must present and evaluate at least two alternatives. As per **10 CSR 20-4.040(9),** the proposed project shall provide for the most cost-effective technology to treat wastewater and nonexcessive I/I to meet the requirements of **10 CSR 20-7.015, Effluent Regulations and 10 CSR 20-7.031, Water Quality Standards.** Please include the construction cost, average annual operation and maintenance cost and 20-year present worth for each alternative. Sewer and rehabilitation projects do not need detailed cost effectiveness analyses.

An estimate of the user charges must be included in the facility plan. **See 10 CSR 20-4.040(9)** and **10 CSR 20-4.040(17).**

Engineering criteria to be used in the design of the project must be included. Design of the proposed wastewater facilities shall be in accordance with **10 CSR 20-8;** however, these rules allow for deviations when adequate justification is presented. In general, justification for a deviation from the rules is considered when the following references are used:

A. Recommended Standards for Wastewater Facilities, Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 2004 Edition. (10 States Standards)

B. Design of Municipal Wastewater Treatment Plants, Fourth Edition. WEF manual of Practice No. 8. ASCE Manual and Report on Engineering Practice No. 76.

C. Wastewater Engineering, Treatment, Disposal and Reuse, Metcalf & Eddy Inc., Fourth Edition

D. Treatment devices or processes not specifically addressed in **10 CSR 20-8** or the above references will be reviewed in accordance with the criteria for evaluating new processes and equipment found at **10 CSR 20-8.020(11)(B)2. or 10 CSR 20-8.140(5)(B).**

The wastewater treatment facility design capacity is the design average flow at the design average BOD. The design should include the appropriate peaking factors for flow and BOD, as previously discussed.

Flood considerations, including the 25 and 100-year flood levels, impact on floodplain and floodway, and compliance with applicable regulations regarding construction in flood prone areas, should be evaluated. **See 10 CSR 20-140(3)(A).**

10 CSR 20-4.040(18) prohibits the use of structures, materials, equipment or processes which are available from a single source unless the applicant's engineer adequately justifies in writing to the department that the proposed use meets the project's minimum needs. If it is known that a particular process or equipment will be procured from a sole source, the justification for sole source procurement should be contained in the facility plan. Otherwise, review of sole source procurement will occur during plans and specification review.

A geohydrological evaluation must be obtained from the department's Division of Geology and Land Survey (DGLS) for projects involving earthen basins such as lagoons or sludge holding basins. The use of an earthen basin will not be approved if the geohydrological evaluation indicates that the proposed earthen basin has severe geological limitations. For projects that propose a new discharge, a Losing/Gaining Stream Classification must be obtained from the Division of Geology and Land Survey.

10. Recommended Project

Please provide the total project costs for the recommended project, which would include construction, engineering, land, legal and administrative costs. Also include the estimated operation and maintenance costs and the estimate of the user charge. For the recommended project, please include the following:

A. Wastewater treatment plant design average and peak flows

B. Wastewater treatment plant design organic loading

C. For treatment plant improvement projects, please indicate what treatment units are to be upgraded or added.

D. For sewer projects, please indicate the average and peak hourly flow requirements for pump stations and sewers.

E. Engineering criteria used for preliminary sizing of the facilities

11. Environmental Review

As per **10 CSR 20-4.050(2)(A)**, applicants seeking a Categorical Exclusion from environmental review will provide sufficient documentation to demonstrate compliance with the criteria of subsection **(1)(A)** of this rule, as follows:

A. Statement indicating that the project is cost-effective and that the applicant is financially capable of constructing, operating and maintaining the facilities.

B. Plan map(s) of the proposed project showing the location of all construction, the planning area boundaries and any known environmentally sensitive areas.

As per **10 CSR 20-4.050(2)(B)**, an environmental information document (EID) must be submitted by those applicants whose proposed projects do not meet the criteria for a Categorical Exclusion. The EID must contain the following:

A. The environmental setting for the project and the future of the environment without the project.

B. The potential environmental impacts of the project as proposed including those that cannot be avoided.

C. The relationship between the short term uses of the environment and the maintenance and enhancement of long term productivity.

D. Any irreversible or irretrievable commitments of resources to the proposed project.

E. A description of public participation activities conducted, issues raised and changes to the project, which may be made as a result of the public participation process.

F. Documentation of coordination with the appropriate governmental agencies (clearances).

Historic Preservation: Missouri Department of Natural Resources State Historic Preservation Program P.O. Box 176 Jefferson City, Missouri 65102 (573) 751- 2479	**Division of State Parks:** Department of Natural Resources Division of State Parks P.O. Box 176 Jefferson City, MO 65102
U.S. Fish and Wildlife Service: U.S. Fish and Wildlife Service Missouri Ecological Services Office 101 Park DeVille Drive, Suite A Columbia, Missouri 65203-0007 (573) 234-2132	**A-95 Clearinghouse**: Office of Administration Intergovernmental Relations P.O. Box 809 Jefferson City, Missouri 65102 (573) 751-4834
Missouri Department of Conservation: Missouri Department of Conservation P.O. Box 180 Jefferson City, MO 65102-0180 (573) 751-4115	**DGLS:** Division of Geology and Land Survey Geological Survey Program P.O. Box 250 Rolla, MO 65401
Corps of Engineers District Office: The State of Missouri is divided between three different Corps of Engineers Districts: the Omaha District, the Kansas City District and the Little Rock District. The district boundaries and addresses for the appropriate district office can be found on the Internet at: http://www.swt.usace.army.mil/address/addressPAO.cfm.	

12. Public Participation

To satisfy the requirements of **10 CSR 20-4.040(14)(A),** a public meeting shall be conducted to discuss the alternative engineering solutions

A. Public Meeting – Facility Plan & Engineering Alternatives (**Per 10 CSR 20-4.040(14)(A),** a public meeting shall be conducted to discuss the alternative engineering solutions. At a minimum, the following information should be presented during the public meeting related to the Facility Plan and Engineering alternatives).

1) Discuss the problems that have created the need to expand/upgrade/repair the existing collection system (e.g. Abatement Order, Violation Notice, etc.).
2) Discuss what alternatives were evaluated. This can include a "no action" alternative. The City should choose the most cost efficient means of collecting their wastewater for the long term.
3) Discuss which option the City is proposing to build and how this option will meet the City's needs.

To document the advertisement requirement was completely within the required time frame, provide verification of the public meeting to the department's Water Protection Program.

B. Public Hearing – Environmental Impact (**Per 10 CSR 20-4.050(2)(B)2**.)

1) The hearing will be advertised for at least 30 days prior to the meeting.
2) A verbatim transcript of the meeting must be submitted to the Water Protection Program director of staff.
3) A list of all attendee's with addresses, any written testimony and applicant's responses to the issues raised.
4) Discuss how the project will impact such areas as wetlands, floodplains, threatened /endangered species, cultural resources, prime farmland, public lands, parks, etc.
5) Discuss how the proposed project may impact the development pattern of the area.
6) Discuss the environmental clearances requested from the numerous agencies.
7) Discuss the impact on personal property such as driveways, trees, easements, etc.
8) Discuss the impact on water quality, air quality, etc.
9) Discussion of the user charges.

To document the advertisement requirement was complete, include a verification of the hearing public notice with the transcript to the department's Water Protection Program.

NOTE: THE PUBLIC MEETINGS AND THE PUBLIC HEARING MUST BE SEPARATE EVENTS AND MUST BE PREFORMED BEFORE A FINDING OF NO SIGNIFICANT IMPACT / ENVIRONMENT ASSESSMENT DETERMINATION CAN BE OBTAINED AND THE FACILITY PLAN IS APPROVED.

Although not part of the requirements for the Facility Plan or the environmental review, the applicant may want to consider holding the public meeting and hearing at the same time for convenience. In addition to the public participation requirements mentioned above, the applicant may want to hold the required public meeting needed for the user charge rates during at the same time as the Public Meeting and the Public Hearing. See the requirements for this meeting below.

C. Public Meeting – User Charge Rates (**Per 10 CSR 20-4.040(14)(B)**)

1) Public notice of the meeting should be published at least 30 days prior to the meeting.
2) A transcript, recording or other complete recording of the meeting shall be prepared and submitted to the department and made available to the public upon request.
3) Outline how the City will finance the cost of the improvements. Sales Tax, Bonds, City Reserves, etc.
4) Discuss what additional costs will result from this project. Additional electricity, upkeep on additional collection lines, additional labor for maintaining the new equipment vs. the current system, etc.
5) Discuss the estimated user rates that will be necessary to cover the Operation & Maintenance (O&M) budget including debt service. NOTE: All users must be charged a proportional rate based on their usage.
6) Discuss when any increases will go into effect (e.g. gradual over a few years, at loan closing, upon completion of construction, etc.)